

in the seventy-third year of his age. He was laid to rest on Tuesday last in Highgate Cemetery, every society with which he was associated sending representatives to his funeral, while among the mourners were some of his old colleagues in India.

A. G.

NOTES.

THE Civil List Pensions granted during the year ended March 31 show more generous recognition of the claims of science than has usually been the case. The list includes the following pensions:—1904, August 8.—Mr. W. F. Denning, in consideration of his services to the science of astronomy, 150*l.* August 8.—Miss Elizabeth Parker, in recognition of the services rendered to science as an investigator by her late father, Mr. W. Kitchen Parker, F.R.S., 100*l.* August 8.—Lady Le Neve Foster, in consideration of the services rendered to mining science by her late husband, Sir Clement Le Neve Foster, F.R.S., and of the fact that his death was due to the effects of poisoning by carbonic oxide gas while carrying out his official duties, 100*l.* 1905, January 17.—Dr. J. G. Frazer, in recognition of his literary merits and of his anthropological studies, 200*l.* March 22.—The Rev. Lorimer Fison, in recognition of the originality and importance of his researches in Australian and Fijian ethnology, 150*l.* March 22.—Dr. W. Cramond, in consideration of his antiquarian researches, more particularly in connection with the ecclesiastical and burghal history of Scotland, 80*l.* March 22.—Miss L. C. Watts and Miss E. S. Watts, in recognition of the services of their late father, Mr. Henry Watts, to chemistry, 75*l.* It is satisfactory to record these tributes of national regard for lives devoted to the advancement of knowledge; and we congratulate the Government upon the great improvement which this year's list shows as regards the acknowledgment of the services rendered to the State by scientific workers.

WE regret to learn that Prof. von Tomek, president of the Imperial Bohemian Academy of Sciences at Prague, died on June 12 in the eighty-eighth year of his age.

SIR JOHN WOLFE BARRY, K.C.B., F.R.S., has been elected to succeed the late Mr. James Mansergh, F.R.S., as chairman of the Engineering Standards Committee.

THE annual conversazione of the Society of Arts will be held in the gardens of the Royal Botanic Society, Regent's Park, on Tuesday next, July 4.

THE International Institute of Sociology has accepted the invitation of the Sociological Society to hold its next congress in London in the summer of 1906. A general committee has been appointed to promote the success of the congress. Lord Avebury is the chairman of the committee, and Mr. David Mair the secretary for the time being.

THE Guy medal in silver has been awarded by the Royal Statistical Society to Mr. R. Henry Rew for his work in connection with the preparation of the reports of the special committee appointed by the society to investigate the production and consumption of meat and milk in the United Kingdom, and for his paper entitled "Observations on the Production of Meat and Dairy Products."

AMONG those who lost their lives in the railway disaster at Mentor, Ohio, on June 21 was Mr. Archibald P. Head, a brilliant young engineer and senior partner in the firm of Messrs. Jeremiah Head and Sons, of Westminster.

Mr. Head was the author of several valuable papers on mining and metallurgy contributed to the Institution of Civil Engineers, the Iron and Steel Institute, and the Society of Arts.

It is announced in the *Times* that the Board of Trade and the Trinity House have concluded a contract with Marconi's Wireless Telegraph Company (Limited) providing for the equipment of lightships with Marconi wireless telegraph installations. This arrangement will enable the lightships to communicate with the shore and with one another by wireless telegraphy for the ordinary purposes of the lightship service, and also to report ships in distress.

A REUTER telegram from Paris reports that an International Congress on Colonial Agriculture was opened there on June 22, Great Britain, Holland, Germany, Italy, Portugal, the United States, Mexico, and Brazil being represented. The members of the congress decided to form an international committee for the study of all questions relating to agricultural science and colonial industries. An organising committee, with headquarters in Paris, under the chairmanship of M. de Lanessan, has been formed.

TOWARD the close of the fourth International Ornithological Congress, an account of which appeared in our issue of last week (p. 177), a party of members paid a visit on June 20 to Cambridge. They were received by Prof. Newton, who had arranged several exhibits for the benefit of the visitors. These included a case of great auks' eggs and a selection of letters, papers, and books from Prof. Newton's library. A catalogue of these documents and books, some of them belonging to the fifteenth century, was distributed among the visitors, as was a leaflet on Legaut's giant bird, by Prof. Newton, explaining its origin and species. A pamphlet by Dr. Gadow on the effects of insularity, illustrated by birds of (a) Madagascar and Mascarene Islands, and (b) the Sandwich Islands, was also circulated to explain the exhibits arranged in the lecture room of comparative anatomy. A visit to the museums having been concluded, a dinner was given to Prof. Newton in the hall of Magdalene, after which Dr. Fatio in a cordial speech referred to Prof. Newton as "the father of ornithology." The congress concluded on June 21 with a visit to Flamborough Head.

DR. J. CHARCOT gave an account of his expedition to Antarctic regions before the Royal Geographical Society on Monday. The general programme of the expedition was to survey the north-west coast of the Palmer Archipelago (Hoseason, Liège, Brabant, and the Antwerp Islands); to study the south-west entrance to the Gerlache Strait, wintering as far south as was practicable, to make excursions in spring, and in summer to continue the exploration of Graham Land, with the view of elucidating the Bismarck Strait, and follow the coast as far as Alexander I. Land; in a word, to continue the labours of the Gerlache and Nordenskjöld expeditions. The expedition left Buenos Ayres in the *Français* (245 tons) on December 23, 1903, reached Smith Island (South Shetlands) on February 1, 1904, and after coasting for a few weeks was compelled by ice to return to Wandel Island, where it wintered. The temperature varied much and suddenly; the lowest was $-30^{\circ}4$ F., but a rise from -22° F. to $+26^{\circ}6$ F. in a few hours was not uncommon, and was always followed by violent gales from the north-east, which broke up the ice between Wandel and Hovgaard Islands, and so prevented any move being made, in spite of many efforts. In December, 1904, a channel was made, and the *Français* returned to Wincke Island, which had been visited before

the winter set in. In January the vessel was turned north again past the Biscoe Islands, the expedition completing its survey as it went, and finally reached Puerto Madryn on March 4. Dr. Charcot expressed himself thoroughly satisfied with the results of the work of the expedition in hydrography, astronomy, biology, the measurement of tides, the analysis of colour and density of sea-water, and gravity, which was measured by means of one of M. Boquet de la Grye's comparison pendulums. The exterior contour of the Biscoe Islands has been fixed and their breadth determined; the survey of the exterior coasts of the Palmer Archipelago completes the geography of that region, and the bearings of Alexander I. Land have been found by astronomical observation.

THE International Congress of Mining and Metallurgy at Liège, which began on June 25, and will continue until July 2, is proving a most successful gathering. Nearly fifteen hundred members have registered, and an attractive programme of papers, visits and excursions, and social functions has been arranged. Mr. Alfred Habets was elected president, and the official representatives nominated by seventeen foreign Governments were elected honorary presidents. Great Britain, though not included in this list, was represented by a strong contingent of members of the Iron and Steel Institute, and by a number of leading mining engineers. The congress was divided into four sections, dealing respectively with mining, metallurgy, applied geology, and mechanics. In the metallurgical section the first paper read was by Mr. R. A. Hadfield, who gave an account of his recent investigations of the properties of steel at the temperature of liquid air. Papers were also read on the influence of arsenic and titanium on pig iron, on the use of coals poor in agglutinating material for the manufacture of coke, and on the cutting of metals by oxygen. In the mining section several papers on shaft-sinking were read, and in the applied geology section attention was chiefly devoted to the recent coal discoveries in the north of Belgium.

WE regret to see the announcement in the *Times* that Sir Augustus Gregory, K.C.M.G., the Australian explorer, died a few days ago. Sir Augustus was born in Nottinghamshire in 1819, and entered the Civil Service of Western Australia in 1841. Five years later he began the series of explorations which were afterwards to make him famous. In 1846 he started with two brothers into the interior from Bolgart Spring, but their eastward progress was stopped by an immense salt lake which compelled them to turn north-west. The deviation led to the discovery by the party of some fine seams of coal in the country at the mouth of the Arrowsmith. Two years later he was sent northwards to explore the Gascoyne River, and he succeeded in reaching a point 350 miles north of Perth. A third exploring expedition was undertaken in 1855, this time under the auspices of the Royal Geographical Society of London. The expedition had the dual object of exploring the interior and of searching for traces of the lost explorer Leichhardt. The party was absent for nearly a year and a half, and though sure traces of Leichhardt were not found, much rich country and new watersheds were discovered. Under the auspices of the New South Wales Government, the search for Leichhardt was renewed in 1858, but again little success rewarded the efforts of the explorer. The Royal Geographical Society, however, showed its appreciation of his labours by conferring upon him the gold medal. In the following year he was appointed Surveyor-General of Queensland, and he after-

wards held several posts of distinction under the Queensland Government. He was the author of several papers on Australian geology and geography.

THE editor of the *Berlin Post* has been kind enough to bring under our notice some flagrant instances of the publication in German newspapers, without acknowledgment, of translations of articles and other contributions which originally appeared in our columns. These translations have been published under the title of "Allgemeine wissenschaftliche Berichte," and the editor of the *Berlin Post* has supplied us with a list of no less than twenty cases in which articles have been taken from *NATURE* and translated into German without any indication of their source. The free use which has thus been made of contributions to our pages may doubtless be regarded as a flattering testimony to their scientific interest and precision; but at the same time, we must express regret that the morality of some writers on scientific subjects in Germany should have sunk so low that they can calmly render our contributions into their own language and offer the translations to newspapers as original descriptive matter. We are glad to know that this iniquitous practice has been discovered by the editor of the *Berlin Post*, and we trust that it will be exposed by the newspapers which have unknowingly printed translations of contributions to our pages.

AMONG the biological contents of the second part of the ninth volume of the *Bulletin International* issued at Prague by the Académie des Sciences de l'Empereur François Joseph is an article by Mr. F. Brabenec on a new discovery of fossil plants in the Tertiary deposits of Holedeč, Bohemia. In addition to a new acacia, the author records remains of two species of the S. European aquatic genus *Salvinia*, one of which is very rare. In another article Dr. B. Němec discusses the influence of light on the position of the leaves in *Vaccinium myrtillus*, while in a third Mr. J. Smolák records the existence of multinuclear cells in certain euphorbias. The European representatives of the insect family Dictyopterygidae form the subject of the one article, by Prof. F. Klapálek, relating to morphological zoology.

REGENERATION and development constitute the leading features of the second part of vol. lxxix. of the *Zeitschrift für wissenschaftliche Zoologie*, which contains three articles. The first of these subjects is discussed by Prof. J. Nusbaum, of Lemberg University, who takes as his text the polychæte annelids *Amphigene mediterranea* and *Nerine cirratulus*, and shows how almost every part of the organism may be reproduced. As regards development, Dr. E. v. Zeller discusses the vesiculæ seminales in newts, and Dr. E. Zander contributes an article on the male generative organs of the Microlepidoptera of the family Butalidae. The latter communication has an interest not indicated in the title, since it discusses the statement that these insects depart from the normal type in possessing only nine (in place of ten) abdominal segments. According to the author, this is an error, due to the wrong orientation of preparations and the consequent mistaking of a true segment for part of the generative apparatus.

IN honour of the International Ornithological Congress, the current issue of *Bird Notes and News* forms a double number, of which the contents include a four-page supplement dealing with protective legislation for birds throughout the British Empire, and likewise an article on international bird-protection, in which attention is directed to the urgency of international agreement on the subject more especially in regard to rare species, migratory birds

and species persecuted for the sake of their plumage. Among other cases mentioned in the article on international bird-protection, special reference is made to the wholesale destruction of penguins in Macquarie Island, and perhaps elsewhere, for the sake of their oil, a destruction which if continued and extended can only result in the extermination of these remarkable and interesting birds. If certain current reports be true, not only is there need of the best efforts of the Bird Protection Society, but the Society for the Prevention of Cruelty to Animals has also a field for its operations, if its arm be long enough to reach the Antarctic.

THE amount of variation that was obtained in cultivating a five-rayed form of *Trifolium pratense* is the subject of a paper by Miss T. Tammes in part xi. of the *Botanische Zeitung*. The production of more than three rays may be regarded as the dominance of the variety, while the production of trifoliate leaves is a reversion to the original form. In the early stages, that is, on first order branches, the leaves generally showed more than three leaflets, but later the trifoliate character was almost constant.

THE avocado or alligator pear, *Persea gratissima*, is rapidly growing in favour with Americans as a salad fruit. On this account Mr. J. H. Rolfs has prepared an account of its cultivation in Florida, which forms Bulletin No. 61 of the Bureau of Plant Industry. Budding affords the most satisfactory method of propagation, as plants do not come true to seed. Two forms are cultivated, the West Indian and a smaller-fruited Mexican variety. The fruit, which only resembles a pear in shape, is eaten like an egg, without condiments or with salad accompaniments.

ALTHOUGH sandal-wood is an important source of revenue in the Indian States of Mysore and Coorg, the parasitic nature of the sandal-tree has been little studied. Mr. C. A. Barber, who originally pointed out that the sandal is a root parasite, producing haustoria, by which it absorbs nourishment from the roots of such host plants as Casuarina and Lantana, has published in the *Indian Forester* (April) an account of further investigations on the subject. The haustorial tissue penetrates the root along the line of the cambium, and thrusts aside the cortex of the host, while absorbent cells and tracheæ are formed to abstract and carry off the food solutions from the wood.

In the *Engineering and Mining Journal* Mr. F. Danvers Power, professor of mining in the University of Sydney, publishes an important memoir on the Gympie Goldfield of Queensland. The district is of special geological interest in view of the enrichment of the gold-bearing quartz veins where they pass through four beds of black shale containing graphite. The deepest shaft in the district has attained a depth of 3130 feet.

WE have received from the Engineering Standards Committee three further reports, dealing respectively with structural steel for shipbuilding, with screw threads, and with pipe threads for iron or steel pipes and tubes. These standard specifications have been drawn up by influential committees composed of representatives of the Institutions of Civil Engineers, Mechanical Engineers and Naval Architects, the Iron and Steel Institute, and the Institution of Electrical Engineers, and will doubtless be generally adopted. In the case of screw threads, no departure from

the Whitworth thread is recommended, and terms used by the British Association small screw gauge committee have, to a large extent, been adopted.

IN a recent paper on the determination of sulphuric acid in soils, attention was directed to the enormous loss of sulphuric anhydride due to the solubility of barium sulphate in ferric chloride solution. If such low results are obtained when determining the sulphur in the presence of small quantities of iron, what losses must be entailed where large amounts of iron are present, as in the case of iron ore? An experimental investigation of the subject has been made by Mr. J. Howard Graham, and the results are published in the *Journal of the Franklin Institute*. They show that barium sulphate is not soluble in ferric chloride to the extent mentioned, but rather that it acts restrainingly upon the act of solution of the barium sulphate in hydrochloric acid until too large quantities of the acid are present.

SINCE their discovery, the various constituents of steel have been the object of numerous researches; but the knowledge of the internal structure of steel has been to a great extent obscured by the acrimonious controversies that have been introduced into the discussion of this subject at meetings of the Iron and Steel Institute. An attempt to remove the existing confusion has been made by Dr. Glazebrook and Prof. H. Le Chatelier by suggesting the formation of an international committee to investigate the matter. The committee is composed as follows:—France: MM. Charpy, Pérot, and H. Le Chatelier; Great Britain: Mr. Hadfield (president of the Iron and Steel Institute), Prof. Arnold, Mr. Stead, F.R.S., and Dr. Glazebrook, F.R.S.; Germany: Prof. Martens; Russia: Mr. Kournakoff; Sweden: Messrs. Brinell and Gunnar Dillner; United States: Messrs. H. M. Howe and Sauveur. The scheme of investigation is published in the current issue of the *Bulletin de la Société d'Encouragement pour l'Industrie nationale*.

THE twenty-seventh report of the Deutsche Seewarte, Hamburg, for the year 1904, shows that the work of marine meteorology and weather prediction is being prosecuted with the usual vigour shown by this useful organisation, and that Admiral Herz is careful to maintain the high efficiency which it attained under the able direction of Dr. von Neumayer. At the end of the year 1904 the number of observers at sea amounted to no less than 837; they are encouraged in their work by the presentation of medals and diplomas, in special cases, in addition to free distribution of atlases and sailing directions. Eleven hundred pilot charts of the North Atlantic Ocean are published monthly, and a similar publication is contemplated for the Indian Ocean; and twelve hundred charts for the North Sea and Baltic are issued quarterly. These are in addition to the publication of larger general discussions at irregular intervals. In the department for weather telegraphy and storm warnings, it may be mentioned that the comprehensive daily weather report shows a considerable improvement by the insertion of kite observations on p. 1. Storm warning telegrams were issued on sixty days, the number of messages to hoist storm signals amounting to 2593. The report exhibits similar activity in other branches of the Seewarte.

THE report on the currents at the entrance of the Bay of Fundy and southern Nova Scotia for the year 1904 has recently been issued. The season from May to September was chiefly occupied by Mr. Bell Dawson, the surveyor in

charge of the work, in examining the currents at the entrance of the Bay of Fundy extending from Grand Manan Island to Cape Sable. These currents were found to be strong, steady, and deep, and therefore contrasted with those previously surveyed on the coasts of Newfoundland. A correct knowledge of the currents in the region surveyed is of great importance to navigation, as it includes waters that lie on the lines of ocean steamships running to St. John's, N.B., as well as of steamers from the United States ports which round the southern end of Nova Scotia on their way to Europe. It has been ascertained from the tide gauges which have been fixed during the survey and the tides recorded since 1902 that from Cape Sable westward the tides can be satisfactorily referred to St. John's, while eastward of Cape Sable they can be referred to Halifax. One noteworthy fact brought out by the survey is that the difference in range between spring tides which fall at perigee or apogee respectively is as great as the difference between mean springs and neaps, showing the dominating influence of the moon's distance in this region; and the variation in the strength of the current is found to follow the same law. Thus at St. John's the range at S.T., when the moon is at perigee, is 27.10 feet, and at apogee 20.35 feet, showing a difference of 6.75 feet. Mean spring range is 23.72 feet, and neaps range 17.43 feet, showing a difference of 6.29 feet. Also the diurnal inequality which is a dominant factor in parts of the Gulf of St. Lawrence is not very strongly marked in this region, although still quite appreciable. It was found that wind disturbance seldom affects the currents at a depth of more than ten fathoms, and that while along the centre line of the Bay of Fundy between the fifty fathoms' line on each side the ebb current runs only at the rate of $1\frac{1}{2}$ to $2\frac{1}{2}$ knots, nearer the shore about eight miles to the right or left the rate is nearly double, or from 3 to 4 knots. The report is accompanied by a map of the Bay of Fundy showing the direction and strength of the tidal currents.

AN index to the literature of indium, by Dr. P. E. Browning, has just been published by the Smithsonian Institution, and forms part of vol. xlv. of the Smithsonian Miscellaneous Collections.

SOME remarkable finds of rare minerals have been made during the opening up of the noted gadolinite locality in Llano County, Texas; they are reported upon by Mr. W. E. Hidden in the June number of the *American Journal of Science*. The development of the mines was undertaken by the Nernst Lamp Co., of Pittsburg, Pa., and among the most notable discoveries were a double crystal of gadolinite weighing 73 lb., a mass of yttrialite weighing 18 lb., and a piece of pure allanite that weighed more than 300 lb. A single crystal of smoky quartz had a weight of 600 lb., and in a single year more than 1000 lb. of nearly pure gadolinite were extracted. Many of the minerals were radio-active, and deep work in the locality seems likely to bring to light new combinations of the rare earths and of uranium and thorium.

IN No. 4 of the *Bulletin International* of the Academy of Sciences of Cracow, M. T. Godlewski shows that it is possible to separate from actinium by a similar method to that used for isolating ThX from thorium an intensely radio-active substance to which the name actinium X is given. The residual actinium is nearly inactive, retaining only 5 per cent. of its original activity, but it recovers its activity with time according to an exponential

curve; the activity of actinium X, on the other hand, decays according to an exponential curve complementary to the curve of recovery. As in the case of thorium, the emanation of actinium is shown to be due to a transformation of actinium X. A complete analogy thus appears to exist between the radio-activity of actinium and thorium. It is interesting, however, to note that actinium itself is probably inactive, whilst thorium free from thorium X has never been obtained with less than 25 per cent. of its original activity. Moreover, the β rays of actinium are completely distinct in character from the β rays emitted by other radio-active elements, inasmuch as they are completely homogeneous with regard to their absorption by solid bodies.

A PAPER by Prof. Theodore W. Richards, Lawrence J. Henderson, and George S. Forbes, which is published in the *Proceedings of the American Academy of Arts and Sciences* (vol. iv., No. 1), deals with the question of the elimination of accidental loss of heat in accurate calorimetry. It is shown that the lag of the thermometer behind the temperature of a slightly cooling or slightly warming environment causes an appreciable error in estimating the temperature of the environment; by a simple method this lag can be accurately determined and allowed for. A new method for obviating this and all other corrections for cooling is shown to consist in systematically altering the temperature of the environment at the same rate and to the same degree as that of the calorimeter proper; this may be effected by allowing a chemical action which liberates heat to take place outside the calorimeter at a graduated velocity. This method is shown in a series of experiments to give a more constant result than can be obtained by introducing a correction for cooling according to the method of either Regnault or Rumford. It is shown, moreover, to give essentially the same value as that afforded by the older methods when these are corrected for the lag of the thermometer.

IN studying the action of fluorine on some compounds of nitrogen, MM. Moissan and Lebeau found that whilst there was no reaction between fluorine and nitrogen peroxide (*NATURE*, June 22, p. 183) there was a vigorous reaction between fluorine and nitric oxide. In the current number of the *Comptes rendus* they give a further account of their work on this reaction, from the products of which they have succeeded in isolating a new compound of fluorine, nitrogen and oxygen, nitryl fluoride, NO_2F . The gaseous products of the reaction, cooled to the temperature of boiling oxygen, gave a white solid which on fractionation at a low temperature proved to consist of a mixture of fluorine and a new substance, condensable at -80°C . By repeated distillation this latter was obtained in a pure state, and gave figures on analysis corresponding to the formula NO_2F . In the gaseous state this has a density of 2.24, the theoretical density being 2.26, a melting point of -139°C . and a boiling point of -63.5°C . Nitryl fluoride possesses very active chemical properties, combining at the ordinary temperature with boron, silicon, phosphorus, arsenic, antimony, and iodine. It is without action in the cold on hydrogen, sulphur, and carbon, but decomposes water, producing nitric and hydrofluoric acids, and reacts with a large number of organic compounds, giving nitro- and fluor-derivatives.

THERE will be an extra meeting of the Physical Society on Friday, June 30, at the Royal College of Science, South Kensington, when the following papers will be read:—the comparison of electric fields by means of an oscillating

electric needle: Mr. David Owen; (1) the magnetic rotatory dispersion of sodium vapour, (2) the fluorescence of sodium vapour: Prof. R. W. Wood. In addition to illustrating his papers by experiments, Prof. Wood proposes to show a number of other experiments.

At a meeting of the Faraday Society to be held on Monday next, July 3, the following papers will be read:—some notes on the rapid electrodeposition of copper: Sherard Cowper-Coles; the use of balanced electrodes: W. W. Haldane Gee; (1) electrolytic oxidation of hydrocarbons of the benzene series, part ii., ethyl benzene, cumene and cymene; (2) electrolytic analysis of antimony: H. D. Law and F. Mollwo Perkin; notes on heat insulation, particularly with regard to materials used in furnace construction: R. S. Hutton and J. R. Beard.

OUR ASTRONOMICAL COLUMN.

ASTRONOMICAL OCCURRENCES IN JULY:—

- July 4. 4h. Venus and Jupiter in conjunction, Venus $2^{\circ} 30' S$.
 „ 5. 11h. 34m. Minimum of Algol (β Persei).
 „ 6. 1h. Venus at greatest elongation, $45^{\circ} 44' W$.
 „ 15. Venus. Illuminated portion of disc = 0.551 ; of Mars = 0.881 .
 „ 16. Uranus passes $1'$ north of γ Sagittarii (Mag. 5.3).
 „ 23. Saturn. Outer major axis of outer ring = $43''.22$; outer minor axis of outer ring = $6''.88$.
 „ 26. 11h. Conjunction of Jupiter with the Moon, Jupiter $4^{\circ} 24' N$.
 „ 27. 10h. 6m. Minimum of Algol (β Persei).
 „ 27–31. Epoch of Aquarid meteoric shower (Radiant $339^{\circ} - 11^{\circ}$).

NEW OBSERVATORY IN ALGERIA.—The accompanying illustration of the Mustapha-Supérieur Observatory (Algeria) is reproduced from *La Nature* (No. 1671), wherein M. Lucien Libert describes in detail the situation and



FIG. 1.—The Mustapha-Supérieur Observatory, Algeria.

equipment of the institution. This observatory was founded privately by M. Jouffray, and is situated to the east of Algiers, on a spur which forms the eastern extremity of the Sahel plateau, at an altitude of 172 metres (about 564 feet) above the sea-level. A special feature of this institution is its exclusive use of the decimal system. The equipment includes a Leroy "tropomètre," i.e. a centesimal chronometer, which divides the day into forty parts or "decagrades," and makes 100,000 beats per day instead of the 86,400 beats made by the ordinary chronometer. The elaborately fitted micrometer, which is used in connection with a Secretan equatorial of 135 mm. ($5\frac{1}{2}$ inches) aperture and 187 cm. (6.1 feet) focal length, has its circle divided into 400 grades, the pitch of the screw being $1'$ (centesimal), and M. Libert contends that the use of these scales effects an immense saving of time and labour. The electrical and mechanical arrangements for

illuminating and controlling the instruments and the dome are described in detail, and appear to be as near perfection as possible. A complete meteorological equipment is also attached to the institution, and M. Libert pleads for the foundation of a similar observatory in southern Algeria, where the sky is but very rarely covered.

A SUSPECTED SUDDEN CHANGE ON JUPITER.—At the meeting of the Royal Astronomical Society held on May 12, a note from Major Molesworth, R.E., was read in which he described a suspected instance of sudden change on Jupiter. Observing at Trincomalee, Ceylon, on December 17, 1903, he made a sketch of the neighbourhood surrounding the dark spot F 87, situated on the southern edge of the S. equatorial belt. This observation was made at 1h. 45.5m. G.M.T. At 2h. the observer suddenly noticed a minute white spot, bright enough to cause him some surprise at having omitted it from his previous observation, preceding and touching F 87. At 2h. 3m. this spot was so obvious that its existence could not have escaped the most casual observer, and later, at 2h. 5m., it had developed into a bright oblique rift only separated by a narrow streak from the spot F 87. This appearance lasted so long as the region remained readily observable. The region was again examined on December 20, but no trace of the outburst could be discerned. When first observed the bright spot was preceding F 87, but later the oblique rift appeared to enter the belt from a point immediately following that feature.

With a lengthy experience in observing Jupiter, Major Molesworth has never before noticed any such change in this region of the planet, but he is perfectly assured that the phenomenon was real. The observations were made under almost perfect conditions of seeing with a $12\frac{1}{4}$ -inch Calver reflector fitted with a Steinheil monocentric eyepiece magnifying 270 times (*Monthly Notices*, May).

BRIGHTNESS OF JUPITER'S SATELLITES.—In a recent note in these columns (May 18) attention was directed to the results obtained by Prof. Wendell from a photometric investigation of the relative brightnesses of Jupiter's satellites. He found that the invariable order of brightness of the satellites was iii., i., ii., iv., but, from a study of the photographic plates obtained at the Cape Observatory during 1891, 1903, and 1904, Prof. W. de Sitter finds that the order of magnitude was, invariably, iii., ii., i., iv., the interval ii.-i. being always of the same order as the intervals iii.-ii. and i.-iv. It thus appears that there must be a considerable difference between the visual and photographic magnitudes of these objects (*Astronomische Nachrichten*, No. 4026).

ELLIPTICAL ELEMENTS FOR THE ORBIT OF COMET 1905 *a*.—Finding that the places derived from parabolic elements for the orbit of comet 1905 *a* did not agree sufficiently well with those observed, Prof. Banachiewicz calculated the following set of elements for an elliptical orbit from several observations made at various places on March 27, April 7, and April 27, and publishes the same in No. 4027 of the *Astronomische Nachrichten*:—

$T = 1905 \text{ April } 4^{\text{h}} 08.096 \text{ (Berlin M.T.)}$.

$$\begin{array}{l} \infty = 358^{\circ} 12' 17.40'' \\ \Omega = 157^{\circ} 27' 41.75'' \\ i = 40^{\circ} 11' 20.76'' \end{array} \left. \vphantom{\begin{array}{l} \infty \\ \Omega \\ i \end{array}} \right\} 1905.0 \quad \begin{array}{l} \log q = 0.0470173 \\ \log e = 9.9856436 \\ P = 200.62 \text{ years} \end{array}$$

The places derived from these elements were found to agree far more satisfactorily with the observed places.

According to a set of elements published by Herr A. Wedemayer in No. 4023 of the same journal, the period of this comet is about 279 years.

RECENT POSITIONS OF EROS.—The following positions for Eros, on the dates named, have been derived from photographs taken by Mr. Manson at Arequipa with the Bruce telescope, apparently the first photographs of the asteroid to be obtained since its recent conjunction with the sun:—

	1905 G.M.T. Exposure.			α (1900)			δ (1900)		
	h.	m.	s.	h.	m.	s.	h.	m.	s.
April 11	19	57	...	70	...	20 36 37	...	-25	4' 5"
	12	20	41	...	134	...	20 38 34	...	-24 55' 6"
	14	20	40	...	45	...	20 42 12	...	-24 39' 1"

(*Astronomische Nachrichten*, No. 4027).